

TEST REPORT

FCC/ISED UNII Test for WOC-0430

FCC: Class II Permissive Change

ISED: Class IV Permissive Change

APPLICANT
JVCKENWOOD Corporation

REPORT NO.
HCT-RF-2510-FI004

DATE OF ISSUE
October 24, 2025

Tested by
Sang Hoon Lee



Technical Manager
Jong Seok Lee



HCT CO., LTD.
BongJai Huh
BongJai Huh / CEO

**HCT CO.,LTD.**

2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea
Tel. +82 31 645 6300 Fax. +82 31 645 6401

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Applicant**JVCKENWOOD Corporation**

3-12, Moriyacho, Kanagawa-ku, Yokohama-shi, Kanagawa, 221-0022, Japan

Product Name

Communication Module

Model Name

W0C-0430

FCC ID

K44515050

IC

282F-515050

Modulation type

OFDM

Date of Test

August 18, 2025 ~ October 15, 2025

FCC Classification

Unlicensed National Information Infrastructure(NII)

Test Standard Used

FCC Rule Part(s): Part 15 subpart E

ISED Rule Part(s):

RSS-247 Issue 4

RSS-Gen Issue 5_Amendment 2

Test Results

PASS

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing

(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	October 24, 2025	Initial Release

Notice

Content

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC/ISED Rules under normal use and maintenance.

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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1. EUT DESCRIPTION

EUT Type	Communication Module	
Model Name	W0C-0430	
Power Supply Voltage	DC 13.8V $\pm$ 15%	
Modulation Type	802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-2C	20 MHz BW : 5500 - 5720
		40 MHz BW : 5510 - 5710
		80 MHz BW : 5530 – 5690
	U-NII-3	20 MHz BW : 5745 - 5825
		40 MHz BW : 5755 - 5795
		80 MHz BW : 5775
Antenna Specification	Type: Chip antenna Peak Gain: 1.90 dBi	
Straddle channel	Supported	
TDWR Band	Not supported	
Dynamic Frequency Selection	Slave without radar detection	
Serial number	Conducted: Body A1A00033, Panel 096 Radiated: Body A1A00032, Panel 048	
PMN (Product Marketing Number)	W0C-0430	
HVIN (Hardware Version Identification Number)	W0C-0430	
FVIN (Firmware Version Identification Number)	N/A	
HMN (Host Marketing Name)	TM-D750A	
Test software(EUT for test)	Aoterm2_V3.03, teraterm-5.0	
Host EUT description	This transmitter module has tested in the specific host devices, TM-D750A as non-stand-alone configuration.	

2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Band	Mode	Maximum output power	
		(dBm)	(W)
UNII2C	802.11a	14.15	0.026
	802.11n (HT20)	13.91	0.025
	802.11n (HT40)	14.14	0.026
	802.11ac (VHT20)	13.92	0.025
	802.11ac (VHT40)	14.26	0.027
	802.11ac (VHT80)	10.17	0.010
UNII3	802.11a	13.44	0.022
	802.11n (HT20)	13.14	0.021
	802.11n (HT40)	9.27	0.008
	802.11ac (VHT20)	13.04	0.020
	802.11ac (VHT40)	9.21	0.008
	802.11ac (VHT80)	9.01	0.008

ANTENNA CONFIGURATIONS

This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4 GHz and 5 GHz bands simultaneously on each antenna.

Simultaneous transmission Scenario	2.4 GHz WLAN	5 GHz WLAN	BT	Test Case
Bluetooth + 2.4 GHz WLAN	on	-	on	Scenario1
Bluetooth + 5 GHz WLAN	-	on	on	Scenario2

3. TEST METHODOLOGY

Unlicensed wireless device were tested using the following measurement procedure.

[1] KDB 789033 D02 15.407 Meas Guidance v02r01.

[2] C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024

Note : Hereinafter, ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 will be referred to as ANSI C63.10-2020

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the RSS-Gen issue 5, RSS-247 issue 4.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10-2020 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average Measurement Type or modes.

Radiated Emissions

According to the requirements in Section 6.3 ~ Section 6.6 of ANSI C63.10-2020

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes.

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated March 11, 2024 (Registration Number: KR0032).

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea. The site is constructed in conformance with the requirements of ANSI C63.4-2014+C63.4a-2017 and ANSI C63.25.1-2018.

Detailed description of test facility was submitted to the Commission and accepted dated March 13, 2024 (CAB identifier: KR0032).

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to ANSI/USEMCSC C63.2-2023, CISPR Publication 16-1, "American National Standard for Specifications of Electromagnetic Interference and Field Strength Measuring Instrumentation in the Frequency Range 9 kHz to 40 GHz", "Radio Interference Measuring Apparatus and Measurement Methods".

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203, § 15.407:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- (1) The antennas of this E.U.T are permanently attached.
- (2) The E.U.T Complies with the requirement of § 15.203, § 15.407

According to RSS-Gen(Issue 5) Section 6.8:

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2020.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$ kHz)
X dB, 99% Bandwidth	95 (Confidence level about 95 %, $k=2$)
Frequency stability	28 (Confidence level about 95 %, $k=2$)

Parameter	Expanded Uncertainty ($\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.54 (Confidence level about 95 %, $k=2$)
Conducted Output Power(Power Meter)	0.54 (Confidence level about 95 %, $k=2$)
Conducted Output Power(Signal Analyzer)	0.68 (Confidence level about 95 %, $k=2$)
Power Spectral Density	1.03 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.68 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.75 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.82 (Confidence level about 95 %, $k=2$)

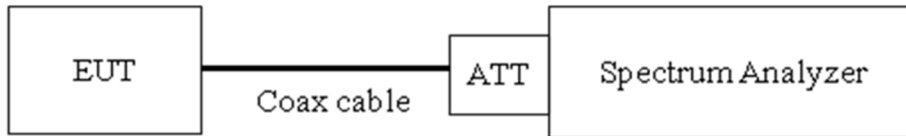
8. DESCRIPTION OF TESTS

Test Item	FCC Test Procedure
Duty Cycle	- KDB 789033 D02 – Section B.2
6 dB Bandwidth & 26dB Bandwidth	- KDB 789033 D02 - Section C
Output Power	- KDB 789033 D02 - Section E
Power Spectral Density	- KDB 789033 D02 - Section F
Frequency Stability	- ANSI C63.10-2020 - Section 6.8
AC Power line Conducted Emissions	- ANSI C63.10-2020– Section 6.2
Radiated Test	- KDB 789033 D02 – Section II.G - ANSI C63.10-2020 – Section 6.4 (Below 30 MHz) - ANSI C63.10-2020 – Section 6.5 (30 MHz to 1000 MHz) - ANSI C63.10-2020 – Section 6.6 (1 GHz to 40 GHz) - ANSI C63.10-2020 – Section 6.10 & 11.12 (Restricted frequency bands)

Test Item	Test Procedure
Duty Cycle	- KDB 789033 D02 – Section B.2
6 dB Bandwidth & 99% Bandwidth	- KDB 789033 D02 - Section C - RSS-GEN - Section 6.7
Output Power	- KDB 789033 D02 - Section E
Power Spectral Density	- KDB 789033 D02 - Section F
Frequency Stability	- ANSI C63.10-2020 - Section 6.8
AC Power line Conducted Emissions	- ANSI C63.10-2020 - Section 6.2
Radiated Test	- KDB 789033 D02 - Section II.G - ANSI C63.10-2020 – Section 6.4 (Below 30 MHz) - ANSI C63.10-2020 – Section 6.5 (30 MHz to 1000 MHz) - ANSI C63.10-2020 – Section 6.6 (1 GHz to 40 GHz) - ANSI C63.10-2020 – Section 6.10 & 11.12 (Restricted frequency bands)

8.1. Duty Cycle

Test Configuration



Test Procedure

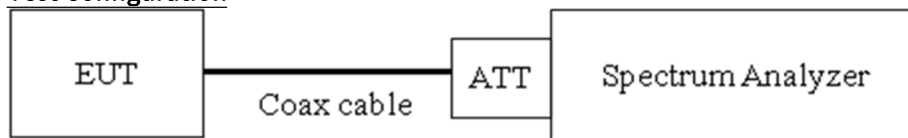
The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Average
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty Cycle})$

8.2. 6 dB Bandwidth & 26 dB Bandwidth & 99% Occupied Bandwidth(ISED)**Limit**

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Configuration**Test Procedure (26 dB Bandwidth)**

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Test Procedure (6 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. RBW = 100 kHz
2. VBW $\geq 3 \times$ RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note:

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.
2. DFS test channels should be defined. So, we performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. The 26 dB bandwidth is used to determine the conducted power limits.

Test Procedure (99 % Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

- 1) RBW = shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth
- 2) VBW $\geq 3 \times$ RBW
- 3) Detector = Peak
- 4) Trace mode = max hold
- 5) Sweep = No faster than coupled (auto) time.
- 6) Allow the trace to stabilize
- 7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set to 6 dB.

Note:

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.
2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. The 99 % Bandwidth is used to determine the conducted power limits.

8.3. Output Power Measurement

FCC Limit

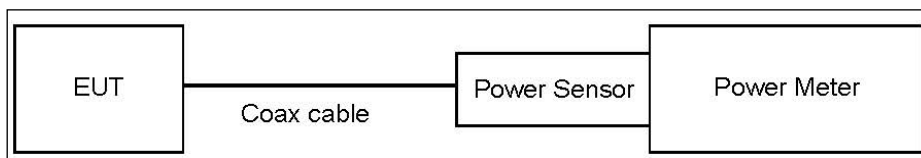
Band	Limit
UNII 2C	Not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

ISED Limit

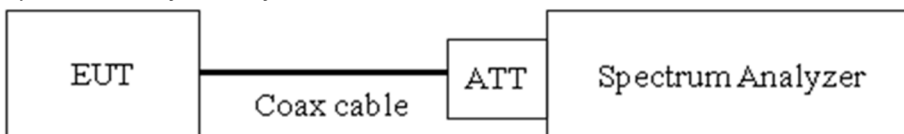
Band	Limit
UNII 2C (EIRP)	1 W (30 dBm) or $17 + 10 \log B$, dBm, whichever power is less
UNII 2C	Not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, (where B is the 99% bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

The transmitter output is connected to the Power Meter.

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Test Procedure (Spectrum Analyzer)

We use the spectrum analyzer's integrated band power measurement function

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW $\geq$ 3 MHz.
5. Number of points in sweep $\geq 2 \times \text{span/RBW}$.
6. Sweep time = auto.
7. Measurement Type or = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

Total Power(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

The power results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 2C	21.67
UNII 3	21.67

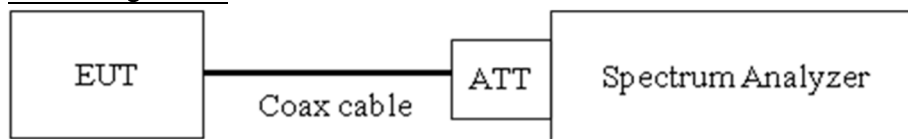
(Actual value of loss for the attenuator and cable combination)

8.4. Power Spectral Density

FCC & ISSED Limit

Band	Limit
UNII 2C	11 dBm/MHz
UNII 3	30 dBm/500 kHz

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
→ For portion within the NII-3 be used RBW 510kHz
3. VBW $\geq$ 3 MHz
4. Number of points in sweep $\geq$ 2 x span/RBW.
5. Sweep time = auto.
6. Measurement Type or = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Type or mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.

Sample Calculation

Total PSD(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 2C	21.67
UNII 3	21.67

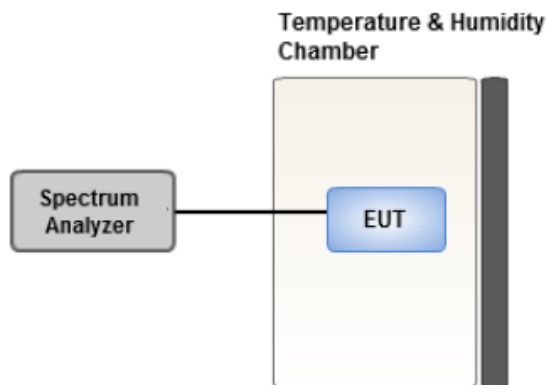
(Actual value of loss for the attenuator and cable combination)

8.5. Frequency Stability

Limit

Maintained within the band

Test Configuration



Test Procedure

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C.
2. The temperature was incremented by 10 °C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

8.6. AC Power line Conducted Emissions

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56 ^(a)	56 to 46 ^(a)
0.50 to 5	56	46
5 to 30	60	50

^(a)Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Measured Value + Correction Factor

8.7. Radiated Test

Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
3. UNII 3: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

FCC

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

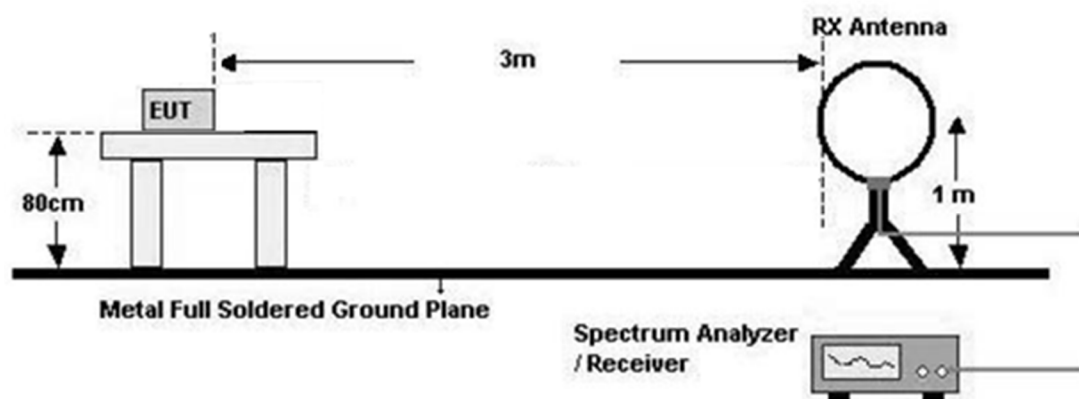
ISED

Frequency (MHz)	Field Strength ($\mu\text{A}/\text{m}$)	Measurement Distance (m)
0.009 – 0.490	$6.37/F$ (F in kHz)	300
0.490 – 1.705	$63.7/F$ (F in kHz)	30
1.705 – 30	0.08	30

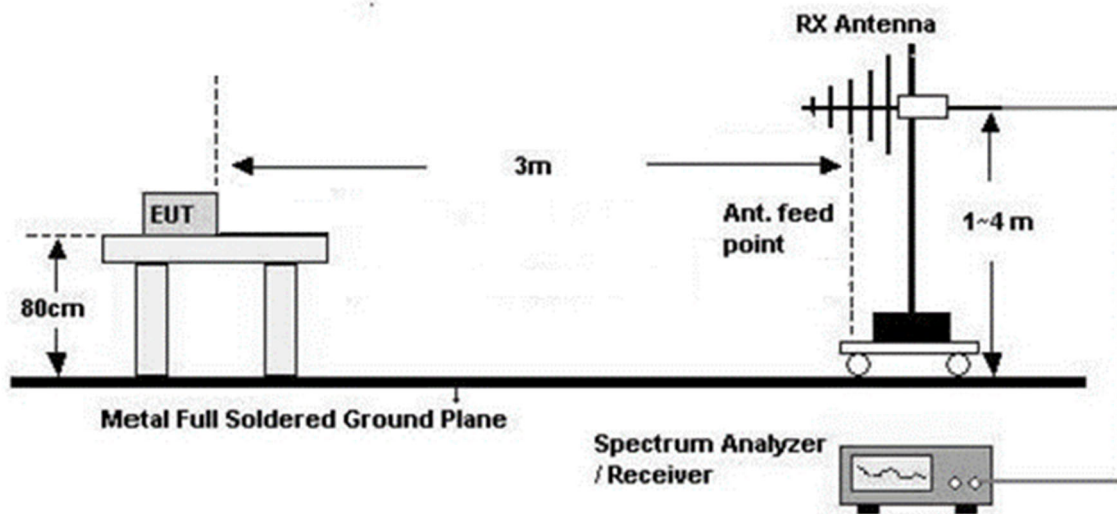
Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

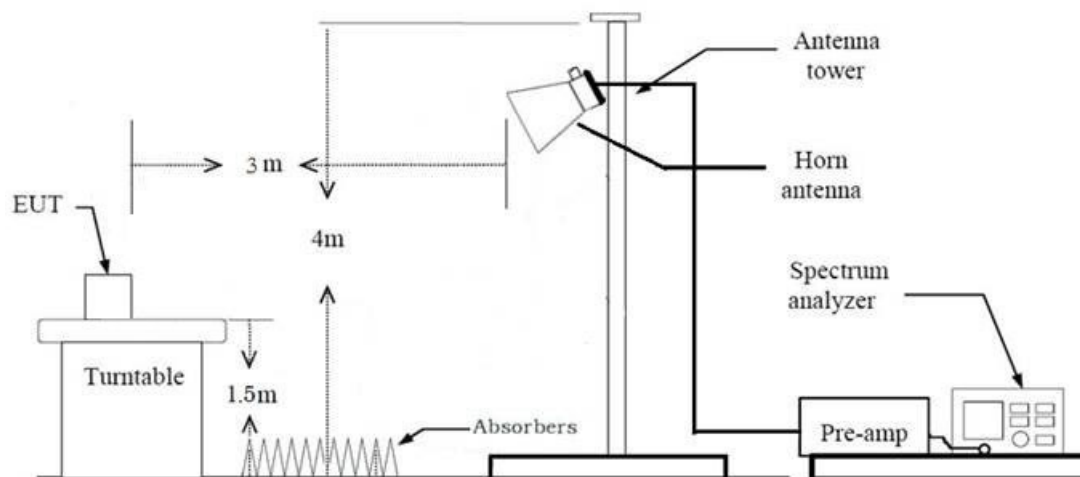
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. .We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = $40\log(3\text{ m}/300\text{ m}) = -80\text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
Measurement Type(Peak) :
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Max Hold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ RBW
9. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions (Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
 - (1) Measurement Type(Peak) :
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Peak
 - Trace = Max Hold
 - RBW = 100 kHz
 - VBW $\geq 3 \times$ RBW
 - (2) Measurement Type(Quasi-peak) :
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
- ※In general, (1) is used mainly
- 7.Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

7. Spectrum Setting**(1) Measurement Type (Peak) :**

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle.

(2) Measurement Type (Average) :

- RBW = 1 MHz
- VBW(Duty cycle $\geq$ 98 percent) = VBW $\leq$ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW $\geq$ $1/T$, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor
9. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
10. Distance extrapolation factor = $20\log(\text{test distance} / \text{specific distance})$ (dB)
11. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G)
+ Distance Factor(D.F)

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

7. Spectrum Setting

(1) Measurement Type (Peak) :

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle.

(2) Measurement Type (Peak, Integration Method) :

- RBW = 100 KHz
- VBW $\geq$ 3 x RBW
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.
- Perform a band-power integration across the 1 MHz bandwidth in which the bandedge emission level is to be measured.

(3) Measurement Type (Average) :

- RBW = 1 MHz
- VBW(Duty cycle $\geq$ 98 percent) = VBW $\leq$ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW $\geq$ $1/T$, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle.

8. Measured Frequency Range :

- 4 500 MHz ~ 5 150 MHz
- 5 350 MHz ~ 5 460 MHz
- 5 460 MHz ~ 5 470 MHz
- (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
- 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)

9. Distance extrapolation factor = $20 \log$ (test distance / specific distance) (dB)

10. Total

(1) Measurement(Peak)

= Measured Value(Peak)

(2) Measurement(Avg)

= Measured Value (Avg)

- We apply to the offset in the range 1 GHz - 18 GHz.

- The offset = Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) – Amp. Gain(A.G) + Attenuator (ATT)

The actual setting value of VBW

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6	0.931	0.309	1 000
802.11n(HT20)	MCS0	0.929	0.320	1 000
802.11ac(VHT20)	MCS0	0.928	0.324	1 000
802.11n(HT40)	MCS0	0.865	0.628	3 000
802.11ac(VHT40)	MCS0	0.866	0.624	3 000
802.11ac(VHT80)	MCS0	0.765	1.164	5 000

8.8. Receiver Spurious Emissions

Limit

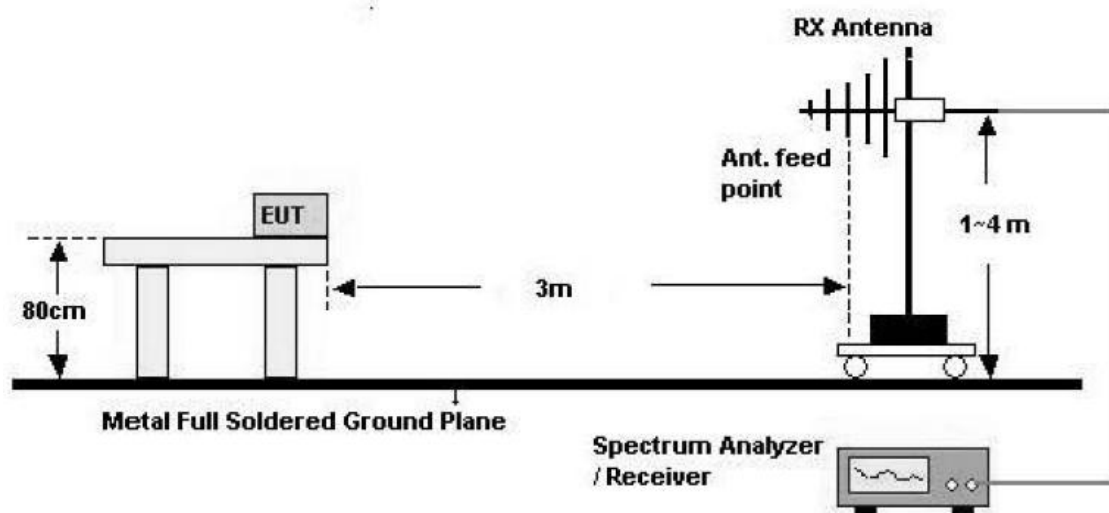
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

Measurements for compliance with the limits in table may be performed at distances other than 3 metres.

Test Configuration

30 MHz - 1 GHz



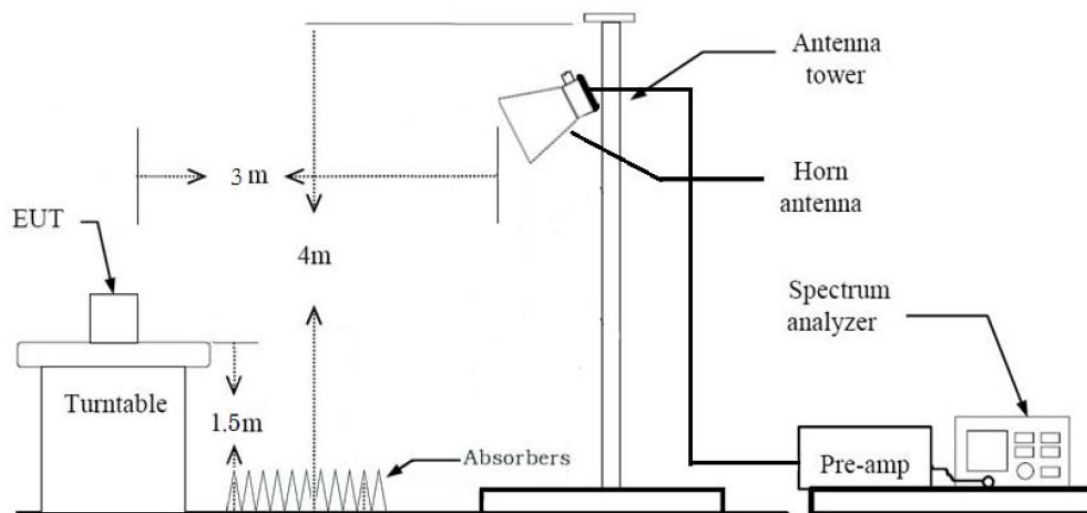
Test Procedure of Receiver Spurious Emissions (Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

6. Spectrum Setting**(1) Measurement Type(Peak):**

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW $\geq$ 3 x RBW

7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) – Amp Gain(A.G)

Above 1 GHz**Test Procedure of Radiated spurious emissions (Above 1 GHz)**

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out

the highest emissions.

5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

7. The unit was tested with its standard battery.

8. Spectrum Setting

(1) Measurement Type(Average):

- RBW = 1 MHz
- VBW = 3 MHz
- Detector = Average(RMS)
- Trace = Average
- Trace was allowed to stabilize

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

10. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F)

8.9. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories (Microphone, Speaker, etc)
 - Worstcase : Stand alone + External accessories (Microphone, Speaker, etc)
2. EUT Axis
 - Radiated Spurious Emissions : Z
 - Radiated Restricted Band Edge : X
3. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
 - Position : Horizontal, Vertical, Parallel to the ground plane
4. All modulation of operation were investigated and the worst case modulation results are reported.
 - 802.11a : 6 Mbps
 - 802.11n(20M, 40M) : MCS 0
 - 802.11ac(20M, 40M, 80M) : MCS 0
5. Radiated Spurious Emission
 - All modulations of operation were investigated and the worst case modulation results are reported.
 - Worst-case : 802.11a_6 Mbps

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. All modulation of operation were investigated and the worst case modulation results are reported.
 - 802.11a : 6 Mbps
 - 802.11n(20M, 40M) : MCS 0
 - 802.11ac(20M, 40M, 80M) : MCS 0

Radiated test(Simultaneous transmission Scenario)

1. All modes of operation were investigated and the worst case configuration results are reported.

- Mode : Stand alone, Stand alone + External accessories(Earphone., etc)

- Worstcase : Stand alone + External accessories(Earphone., etc)

2. EUT Axis

- Radiated Spurious Emissions : X

3. All of Simultaneous transmission Scenario were investigated and the worst case configuration results are reported.

Simultaneous transmission Scenario	2.4 GHz WLAN	5 GHz WLAN	BT	Test Case
Bluetooth + 2.4 GHz WLAN	on	-	on	Scenario1
Bluetooth + 5 GHz WLAN	-	on	on	Scenario2

4. The Simultaneous transmission Scenario mode test investigated both intermodulation and radiated spurious emissions.

And the worst results were reported.

- Worst result: Radiated spurious emissions

- Intermodulation: No signals are generated.

- Radiated spurious emissions: cf. Section 10.2.

5. The simultaneous transmission scenario mode was tested under the following conditions.

.- Bluetooth: The EUT is set to a normal “paired” mode with another Bluetooth device.

.- Wireless LAN: The EUT was set to a connection with access point according to the normal intended use of the product, and to facilitate testing, it was configured to transmit at a high duty cycle through file transfer.

Test Case	Description	Bluetooth Emission	5 GHz Emission
Scenario2	Channel	-	157
	Data Rate	-	6 Mbps
	Mode	Hopping	802.11a

Note : BT Simultaneous transmission Scenario Data refer to [BT] Test Report.

9. SUMMARY OF TEST RESULTS

FCC Part

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result	Status
26 dB Bandwidth	§ 15.407 (for Power Measurement)	N/A	Conducted	PASS	NT ^{Note2}
6 dB Bandwidth	§ 15.407(e)	>500 kHz (5725-5850 MHz)(UNII-3)		PASS	NT ^{Note2}
Maximum Conducted Output Power	§ 15.407(a)(1),(2),(3)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5470-5725 MHz) <1 W (5725-5850 MHz)		PASS	C ^{Note4}
Maximum Power Spectral Density	§ 15.407(a)(1),(2),(3)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS	NT ^{Note2}
Frequency Stability	§ 15.407(g) § 2.1055	Maintained within the band		PASS	NT ^{Note2}
AC Conducted Emissions 150 kHz-30 MHz	15.207 15.407(b)(8)	<FCC 15.207 limits		PASS	NT ^{Note2}
Undesirable Emissions	§ 15.407(b) (1),(2),(3),(4) § 15.407(b)(5)(ii),(iii) § 15.35(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.6 (UNII 3)	Radiated	PASS	C ^{Note4}
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9),(10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS	C ^{Note4}

Note:

1. C = Comply, NT = Not Tested, NA = Not Applicable, NC = Not Comply
2. C2PC model is electrically identical to the Original model.
3. The data from that application has been verified through fully tests to demonstrate compliance of this device, as shown in the test results in Section 10.
4. The output power was verified to be within the tuning tolerance and the original output power range, as shown in the test results in Section 10.

ISED Part

Test Description	ISED Part Section(s)	Test Limit	Test Condition	Test Result	Status
99% Bandwidth	RSS-GEN, 6.7	N/A	Conducted	PASS	NT ^{Note2}
6 dB Bandwidth	RSS-247, 7.3.4.2	> 500 kHz NII-3(5725-5850 MHz)		PASS	NT ^{Note2}
Maximum Conducted Output Power	RSS-247, 7.3.2.2 RSS-247, 7.3.3.2	<250 mW or 11+10 log ₁₀ (BW) dBm (5250-5350 MHz, 5470-5725 MHz) Whichever power is less		PASS	NT ^{Note2}
	RSS-247, 7.3.4.3	<1 W (5725-5850 MHz)			C ^{Note4}
Maximum e.i.r.p	RSS-247, 7.3.1.2 RSS-247, 7.3.2.2 RSS-247, 7.3.3.2	<200 mW or 10+10 log ₁₀ (BW) dBm NII-1(5150-5250 MHz), <1 W or 17+10 log ₁₀ (BW) dBm (5250-5350 MHz, 5470-5725 MHz) Whichever power is less		PASS	C ^{Note4}
Power Spectral Density	RSS-247, 7.3.1.2 RSS-247, 7.3.2.2 RSS-247, 7.3.3.2	<10 dBm/ MHz(e.i.r.p.) (5150-5250 MHz) <11 dBm/MHz(Conducted) (5250-5350 MHz, 5470-5725 MHz)		PASS	NT ^{Note2}
	RSS-247, 7.3.4.3	<30 dBm/500 kHz(Conducted) NII-3(5725-5850 MHz)			NT ^{Note2}
Frequency Stability	RSS-GEN 8.11	should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation.		PASS	NT ^{Note2}
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, 8.8	RSS-GEN section 8.8 table 4		PASS	NT ^{Note2}
Undesirable Emissions	RSS-247, 7.3.1.3	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS	NT ^{Note2}
	RSS-247, 7.3.1.3 RSS-247, 7.3.2.3 RSS-247, 7.3.3.3	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	Radiated	PASS	C ^{Note4}
	RSS-247, 7.3.4.4	cf. Section 8.7(NII-3) e.i.r.p spectral Density			C ^{Note4}
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-GEN, 8.9 RSS-GEN, 8.10	RSS-Gen section 8.9 table 5, 6 section 8.10 table 7		PASS	C ^{Note4}
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS	C ^{Note4}

Note:

1. C = Comply, NT = Not Tested, NA = Not Applicable, NC = Not Comply
2. C4PC model is electrically identical to the Original model.
3. The data from that application has been verified through fully tests to demonstrate compliance of this device, as shown in the test results in Section 10.
4. The output power was verified to be within the tuning tolerance and the original output power range, as shown in the test results in Section 10.

10. TEST RESULT

10.1 OUTPUT POWER

Total Power[dBm] = Measured Power[dBm] + D.C.F[dB]

Limit (FCC)

(UNII 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

Limit (ISED)

(UNII 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 99% Bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

Mode	Band	Freq. [MHz]	CH.	DataRate	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Antenna gain [dB]	EIRP [dBm]	FCC Limit [dBm]	ISED Limit [dBm]
802.11a	UNII2C	5500	100	6M	11.65	0.31	11.96	1.90	13.86	23.98	23.42
		5580	116	6M	13.84	0.31	14.15	1.90	16.05	23.98	23.42
		5720	144	6M	11.04	0.31	11.35	1.90	13.25	23.98	23.33
	UNII3	5745	149	6M	10.85	0.31	11.16	-	-	30.00	30.00
		5785	157	6M	13.13	0.31	13.44	-	-	30.00	30.00
		5825	165	6M	10.26	0.31	10.57	-	-	30.00	30.00
802.11n (HT20)	UNII2C	5500	100	MCS0	11.32	0.32	11.64	1.90	13.54	23.98	23.67
		5580	116	MCS0	13.59	0.32	13.91	1.90	15.81	23.98	23.67
		5720	144	MCS0	10.82	0.32	11.14	1.90	13.04	23.98	23.53
	UNII3	5745	149	MCS0	10.44	0.32	10.76	-	-	30.00	30.00
		5785	157	MCS0	12.82	0.32	13.14	-	-	30.00	30.00
		5825	165	MCS0	9.81	0.32	10.13	-	-	30.00	30.00
802.11ac (VHT20)	UNII2C	5500	100	MCS0	11.34	0.32	11.66	1.90	13.56	23.98	23.66
		5580	116	MCS0	13.60	0.32	13.92	1.90	15.82	23.98	23.66
		5720	144	MCS0	10.79	0.32	11.11	1.90	13.01	23.98	23.55
	UNII3	5745	149	MCS0	10.46	0.32	10.78	-	-	30.00	30.00
		5785	157	MCS0	12.72	0.32	13.04	-	-	30.00	30.00
		5825	165	MCS0	9.91	0.32	10.23	-	-	30.00	30.00
802.11n (HT40)	UNII2C	5510	102	MCS0	9.69	0.63	10.32	1.90	12.22	23.98	23.98
		5550	110	MCS0	13.51	0.63	14.14	1.90	16.04	23.98	23.98
		5710	142	MCS0	9.08	0.63	9.71	1.90	11.61	23.98	23.98
	UNII3	5755	151	MCS0	8.64	0.63	9.27	-	-	30.00	30.00
		5795	159	MCS0	8.26	0.63	8.89	-	-	30.00	30.00
802.11ac (VHT40)	UNII2C	5510	102	MCS0	9.52	0.62	10.14	1.90	12.04	23.98	23.98
		5550	110	MCS0	13.64	0.62	14.26	1.90	16.16	23.98	23.98
		5710	142	MCS0	9.15	0.62	9.77	1.90	11.67	23.98	23.98
	UNII3	5755	151	MCS0	8.59	0.62	9.21	-	-	30.00	30.00
		5795	159	MCS0	8.21	0.62	8.83	-	-	30.00	30.00
802.11ac (VHT80)	UNII2C	5530	106	MCS0	9.01	1.16	10.17	1.90	12.07	23.98	23.98
		5690	138	MCS0	8.51	1.16	9.67	1.90	11.57	23.98	23.98
	UNII3	5775	155	MCS0	7.85	1.16	9.01	-	-	30.00	30.00

10.2 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

Frequency	Measured Value	C.L+A.F+D.F	ANT. POL	Total	Limit	Margin
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]

No Critical peaks found

Note:

1. The Measured Value of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific Limits (dBμV) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	ANT. POL	Total	Limit	Margin
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]

No Critical peaks found

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode

Frequency Range : Above 1 GHz

Band : UNII 2C			Operation Mode : 802.11a				
CH.100 5500 MHz			Transfer Rate : 6 Mbps				
Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11000	42.79	9.22	V	52.01	73.98	21.97	PK
11000	29.08	9.22	V	38.30	53.98	15.68	AV
16500	42.27	11.77	V	54.04	68.20	14.16	PK
11000	42.88	9.22	H	52.10	73.98	21.88	PK
11000	29.17	9.22	H	38.39	53.98	15.59	AV
16500	42.06	11.77	H	53.83	68.20	14.37	PK

Band : UNII 2C			Operation Mode : 802.11a				
CH.116 5580 MHz			Transfer Rate : 6 Mbps				
Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11160	43.67	9.77	V	53.44	73.98	20.54	PK
11160	30.88	9.77	V	40.65	53.98	13.33	AV
16740	42.41	11.42	V	53.83	68.20	14.37	PK
11160	43.81	9.77	H	53.58	73.98	20.40	PK
11160	31.03	9.77	H	40.80	53.98	13.18	AV
16740	42.30	11.42	H	53.72	68.20	14.48	PK

Band : UNII 2C			Operation Mode : 802.11a				
CH.144 5720 MHz			Transfer Rate : 6 Mbps				
Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11440	42.58	10.29	V	52.87	73.98	21.11	PK
11440	29.43	10.29	V	39.72	53.98	14.26	AV
17160	42.68	11.43	V	54.11	68.20	14.09	PK
11440	42.65	10.29	H	52.94	73.98	21.04	PK
11440	29.52	10.29	H	39.81	53.98	14.17	AV
17160	42.43	11.43	H	53.86	68.20	14.34	PK

Band : UNII 3			Operation Mode : 802.11a				
CH.149 5745 MHz			Transfer Rate : 6 Mbps				
Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11490	42.70	10.28	V	52.98	73.98	21.00	PK
11490	29.47	10.28	V	39.75	53.98	14.23	AV
17235	41.53	11.82	V	53.35	68.20	14.85	PK
11490	42.45	10.28	H	52.73	73.98	21.25	PK
11490	29.29	10.28	H	39.57	53.98	14.41	AV
17235	41.29	11.82	H	53.11	68.20	15.09	PK

Band : UNII 3			Operation Mode : 802.11a				
CH.157 5785 MHz			Transfer Rate : 6 Mbps				
Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11570	44.15	9.50	V	53.65	73.98	20.34	PK
11570	30.72	9.50	V	40.22	53.98	13.77	AV
17355	43.55	12.60	V	56.15	68.20	12.05	PK
11570	43.57	9.50	H	53.07	73.98	20.92	PK
11570	30.66	9.50	H	40.16	53.98	13.83	AV
17355	43.06	12.60	H	55.66	68.20	12.54	PK

Band : UNII 3			Operation Mode : 802.11a				
CH.165 5825 MHz			Transfer Rate : 6 Mbps				
Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11650	43.13	9.35	V	52.48	73.98	21.50	PK
11650	30.16	9.35	V	39.51	53.98	14.47	AV
17475	41.37	13.73	V	55.10	68.20	13.10	PK
11650	43.05	9.35	H	52.40	73.98	21.58	PK
11650	30.08	9.35	H	39.43	53.98	14.55	AV
17475	41.11	13.73	H	54.84	68.20	13.36	PK

[Simultaneous transmission Scenario]

Scenario2

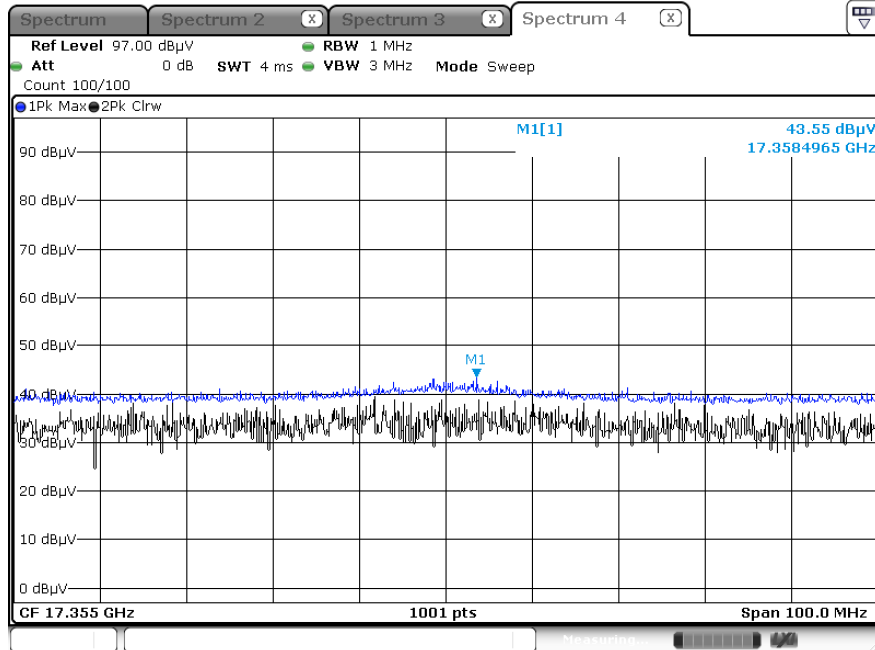
Bluetooth Hopping Mode + 5 GHz 802.11a_Ch.157

Frequency [MHz]	Measured value [dBμV]	C.L+A.F+D.F-A.G [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
11570	43.01	9.50	V	52.51	73.98	21.48	PK
11570	30.03	9.50	V	39.53	53.98	14.46	AV
17355	41.78	12.60	V	54.38	68.20	13.82	PK
11570	42.85	9.50	H	52.35	73.98	21.64	PK
11570	29.76	9.50	H	39.26	53.98	14.73	AV
17355	41.90	12.60	H	54.50	68.20	13.70	PK

Test Plots

Note: Worst case plots for Radiated Spurious Emissions are only reported.

Radiated Spurious Emissions plot – Peak Result (802.11a, Ch.157 3rd Harmonic, Z-V)

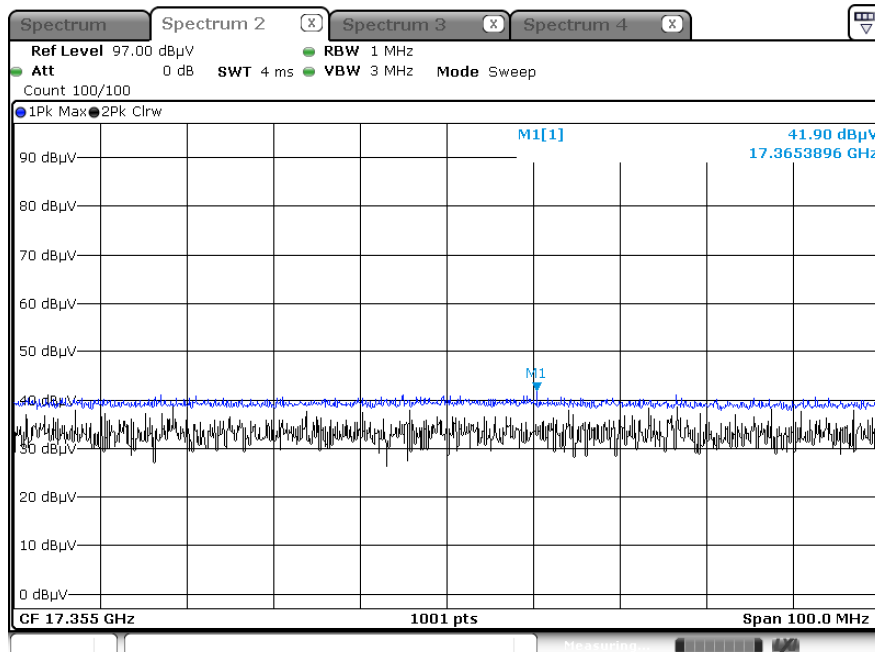


[Simultaneous transmission Scenario]

Scenario2

Bluetooth Hopping Mode + 5 GHz 802.11a_Ch.157

Radiated Spurious Emissions plot – Peak Result (802.11a_Ch.157, 3rd Harmonic, X-H)



10.3 RADIATED RESTRICTED BAND EDGES

802.11 a		6 Mbps					
Channel	Ch. 100	5500 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	58.06	-	V	58.06	73.98	15.92	PK
5460	44.35	-	V	44.35	53.98	9.63	AV
5470	62.23	-	V	62.23	68.20	5.97	PK

802.11 n_HT20		MCS 0					
Channel	Ch. 100	5500 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	57.74	-	V	57.74	73.98	16.24	PK
5460	43.82	-	V	43.82	53.98	10.16	AV
5470	58.80	-	V	58.80	68.20	9.40	PK

802.11 ac_VHT20		MCS 0					
Channel	Ch. 100	5500 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	57.18	-	V	57.18	73.98	16.80	PK
5460	43.91	-	V	43.91	53.98	10.07	AV
5470	58.70	-	V	58.70	68.20	9.50	PK

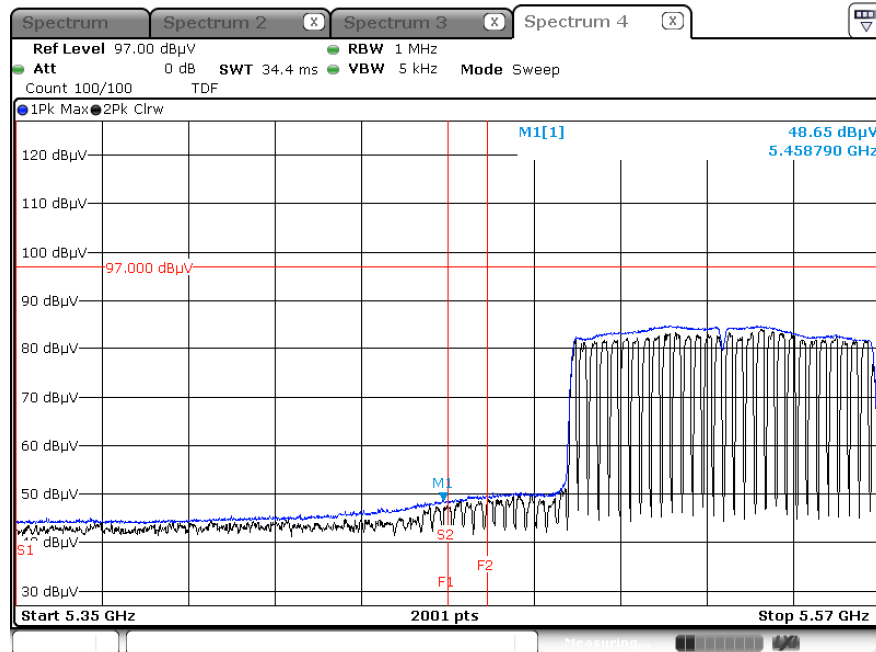
802.11 n_HT40		MCS 0					
Channel	Ch. 102	5510 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	59.29	-	V	59.29	73.98	14.69	PK
5460	45.55	-	V	45.55	53.98	8.43	AV
5470	62.06	-	V	62.06	68.20	6.14	PK

802.11 ac_VHT40		MCS 0					
Channel	Ch. 102	5510 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	58.90	-	V	58.90	73.98	15.08	PK
5460	45.74	-	V	45.74	53.98	8.24	AV
5470	62.78	-	V	62.78	68.20	5.42	PK

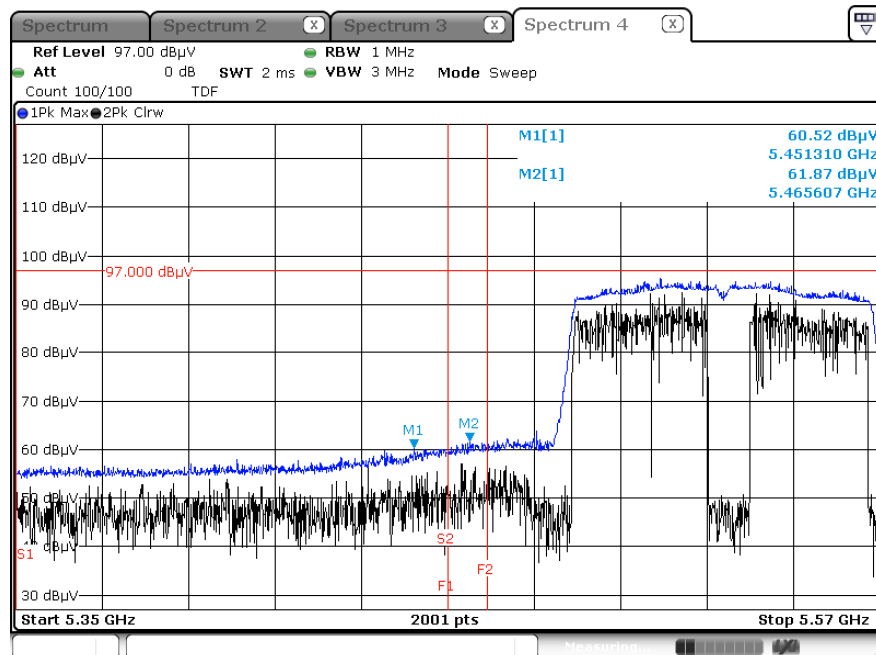
802.11 ac_VHT80		MCS 0					
Channel	Ch. 106	5530 MHz	UNII 2C				
Frequency	Measured Value	C.L+A.F+D.F-A.G+ATT	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	Type
5460	60.52	-	V	60.52	73.98	13.46	PK
5460	48.65	-	V	48.65	53.98	5.33	AV
5470	61.87	-	V	61.87	68.20	6.33	PK

Test Plots(UNII 2C)

Radiated Restricted Band Edges plot - Average Result (802.11ac_VHT80_ MCS0, Ch. 106, X-V)



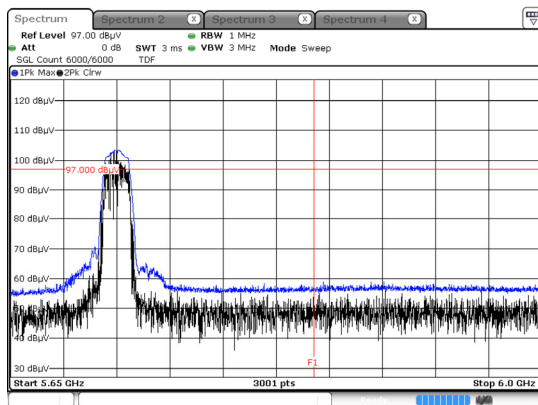
Radiated Restricted Band Edges plot - Peak Result (802.11ac_VHT80_ MCS0, Ch. 106, X-V)



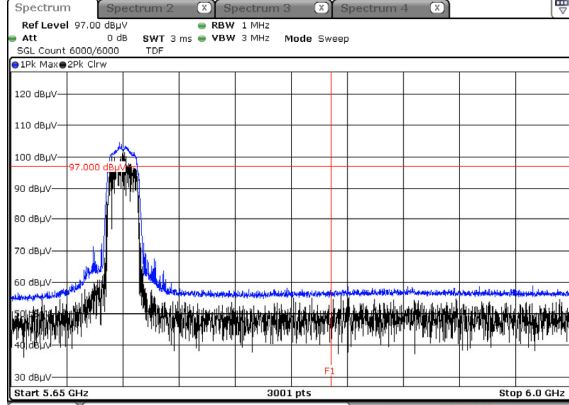
Note: Worst case plots for Radiated Restricted Band Edge are only reported.

Test Plots(Straddle Channel)

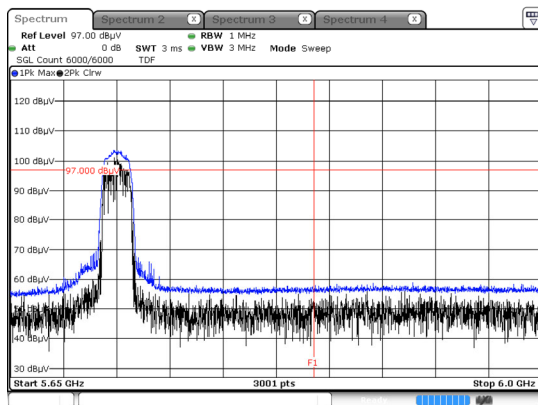
Peak Result (802.11a, Ch.144, X-H)



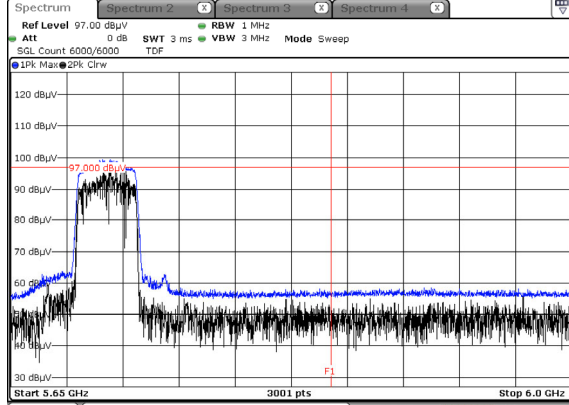
Peak Result (802.11n_HT20, Ch.144, X-H)



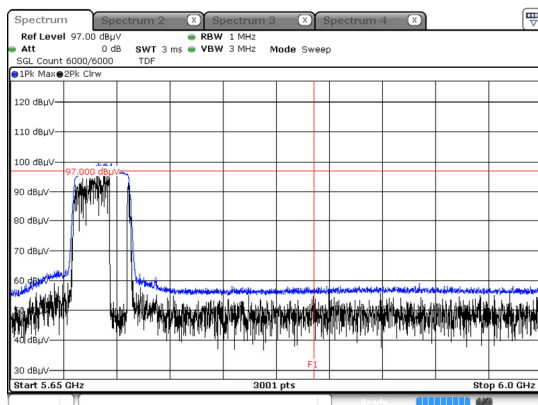
Peak Result (802.11ac_VHT20, Ch.144, X-H)



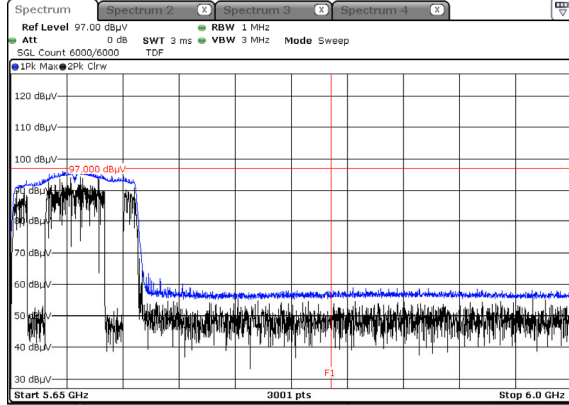
Peak Result (802.11n_HT40, Ch.142, X-H)



Peak Result (802.11ac_VHT40, Ch.142, X-H)



Peak Result (802.11ac_VHT80, Ch.138, X-H)

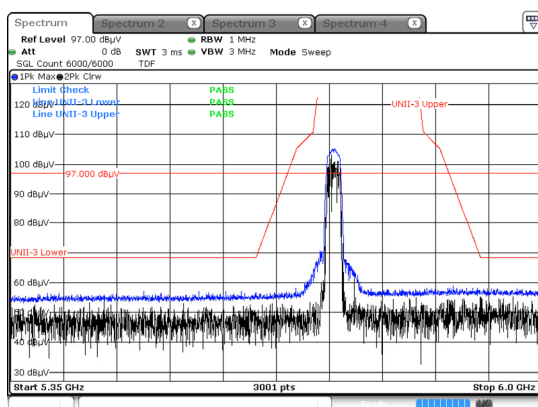


Note :

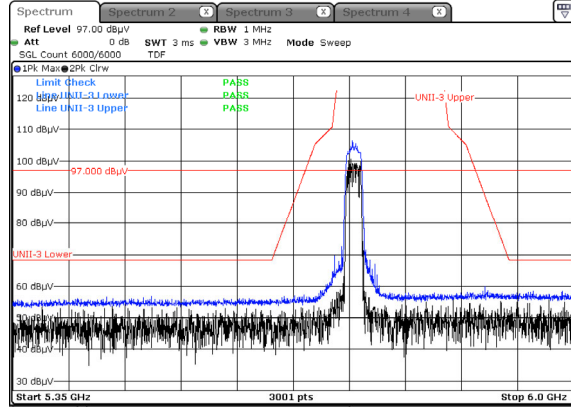
1. Worst case plots for Radiated Restricted Band Edges are only reported.
2. Red line : 5 850 MHz

Test Plots(UNII 3)

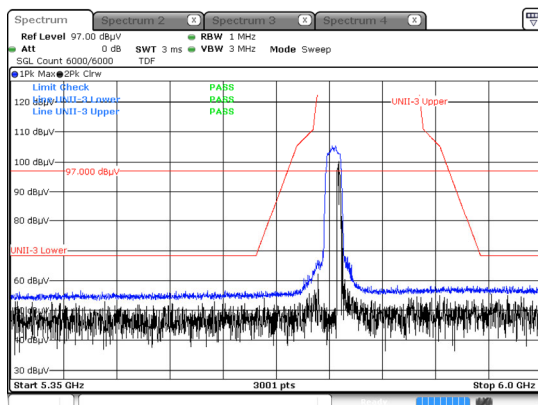
Peak Result (802.11a, Ch.149, Y-V)



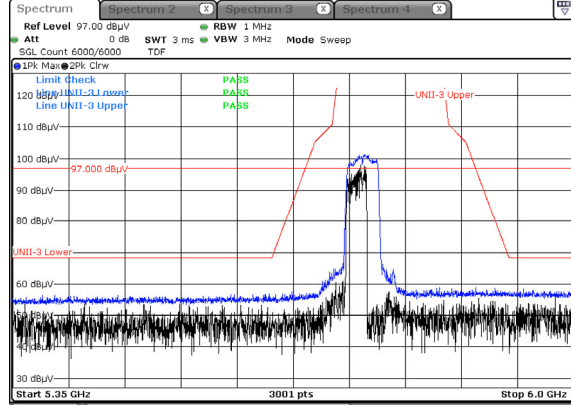
Peak Result (802.11n_HT20, Ch.149, Y-V)



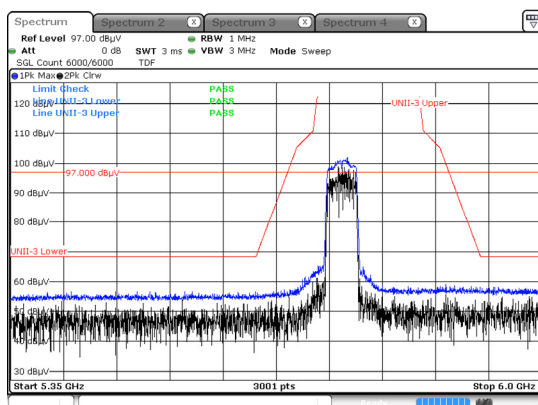
Peak Result (802.11ac_VHT20, Ch.149, Y-V)



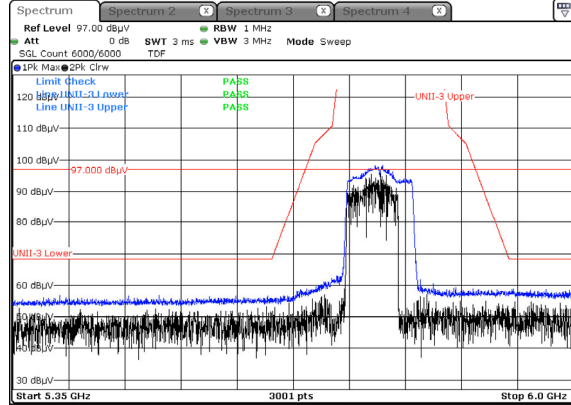
Peak Result (802.11n_HT40, Ch.151, Y-V)



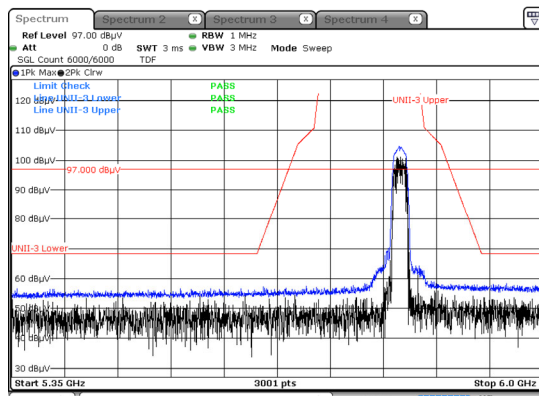
Peak Result (802.11ac_VHT40, Ch.151, Y-V)



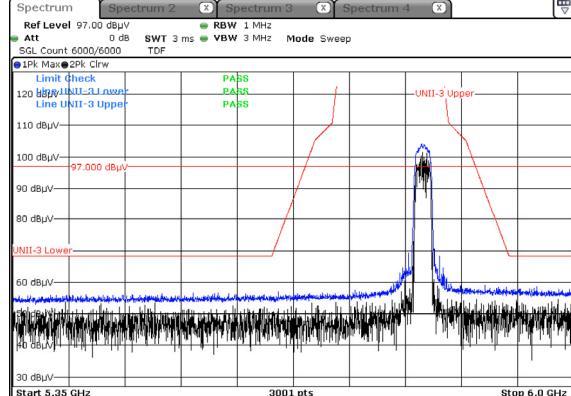
Peak Result (802.11ac_VHT80, Ch.155, Y-V)



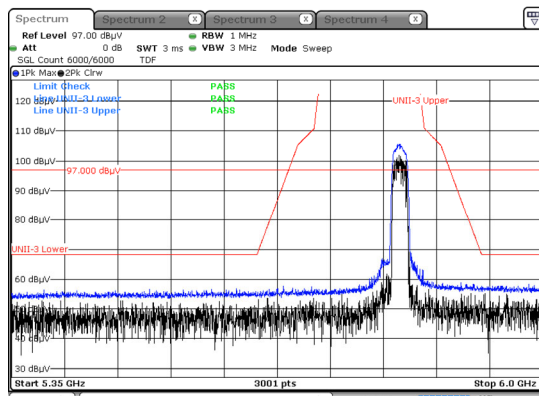
Peak Result (802.11a, Ch.165, Z-H)



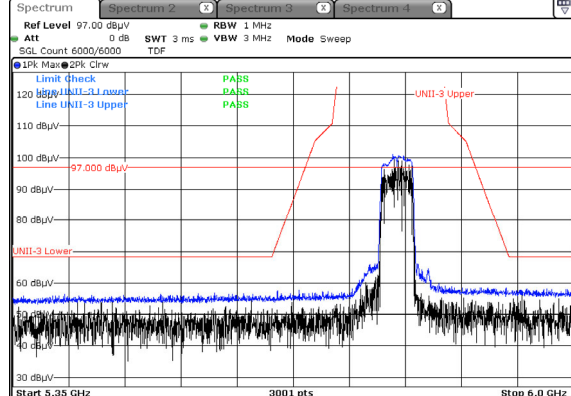
Peak Result (802.11n_HT20, Ch.165, Z-H)



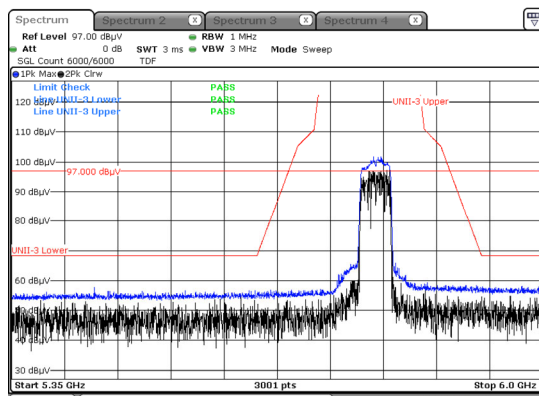
Peak Result (802.11ac_VHT20, Ch.165, Z-H)



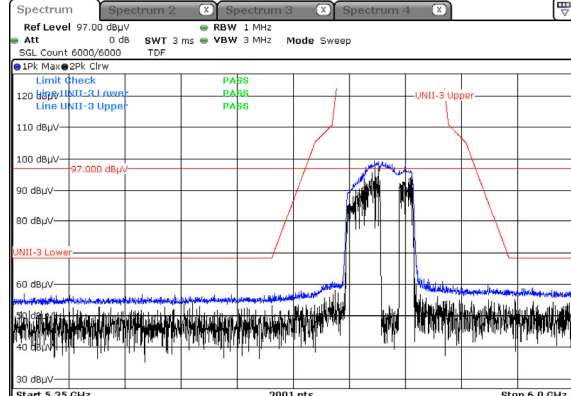
Peak Result (802.11n_HT40, Ch.159, Z-H)



Peak Result (802.11ac_VHT40, Ch.159, Z-H)



Peak Result (802.11ac_VHT80, Ch.155, Z-H)



Note :

1. worst case plots for U-NII-3 Out of Band e.i.r.p Emission are only reported.

10.4 RECEIVER SPURIOUS EMISSIONS

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	ANT. POL	Total	Limit	Margin
[MHz]	[dB μ V]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]

No Critical peaks found

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.

Frequency Range : Above 1 GHz

Frequency	Measured Value	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin
[MHz]	[dB μ V]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]

No Critical peaks found

11. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	07/15/2026	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	08/20/2026	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	02/11/2026	Annual
Signal Analyzer	N9030A	Agilent	MY49432108	02/18/2026	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	100935	07/24/2026	Annual
Power Meter	N1911A	Agilent	MY45100523	02/21/2026	Annual
Power Sensor	N1921A	Agilent	MY57820067	02/04/2026	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/14/2026	Annual
Power Splitter	11667B	Hewlett Packard	10545	01/23/2026	Annual
DC Power Supply	E3632A	Agilent	KR75303243	04/16/2026	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	07560	05/27/2026	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	08285	05/19/2026	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	02/18/2026	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
Bluetooth Tester	CBT	Rohde & Schwarz	100752	12/27/2025	Annual
Automation Software	FCC WLAN Conducted	HCT CO., LTD	N/A	N/A	N/A
Automation Software	FCC Bluetooth Conducted	HCT CO., LTD	N/A	N/A	N/A

Note:

- Equipment listed above that calibrated during the testing period was set for test after the calibration.
- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	S1AM	07/25/2026	Annual
Turn Table	DS2000-S-1t	Innco system	DS2000/572/54610422/P	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	T&M system	TM19050002	N/A	N/A
Loop Antenna	1513	Schwarzbeck	1513-175	01/06/2027	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/28/2026	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1300	01/03/2026	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-2296	05/16/2026	Biennial
Horn Antenna(15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/07/2026	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	12/26/2025	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	05/27/2026	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	05/27/2026	Annual
High Pass Filter(7 GHz ~ 18 GHz)	WHKX10-7150-8000-18000-50SS	Wainwright Instruments	1	02/21/2026	Annual
Power Amplifier	CBL18265035	CERNEX	22966	10/21/2026	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/19/2026	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/12/2026	Annual
RF Switching System	FMSR-05B (HPF(3~18GHz) + LNA1(1~18GHz))	T&M system	S1L1	12/23/2025	Annual
RF Switching System	FMSR -05B (ATT(10dB) + LNA1(1~18GHz))	T&M system	S1L2	12/23/2025	Annual
RF Switching System	FMSR -05B (ATT(3dB) + LNA1(1~18GHz))	T&M system	S1L3	12/23/2025	Annual
RF Switching System	FMSR -05B (LNA1(1~18GHz))	T&M system	S1L4	12/23/2025	Annual
RF Switching System	FMSR -05B (HPF(7~18GHz) + LNA2(6~18GHz))	T&M system	S1L5	12/23/2025	Annual
RF Switching System	FMSR -05B (Thru(30MHz ~ 18GHz))	T&M system	S1L6	12/23/2025	Annual
Automation Software	FCC WLAN Radiated	HCT CO., LTD	N/A	N/A	N/A
Attenuator(3 dB)	18B-03	Api tech.	1	04/21/2026	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

12. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2510-FI004-P